GETTY REFINING & MARKETING COMPANY'S

BAKERSFIELD REFINERY

Getty

Growth ... and Change

To meet future energy demands, Getty Refining and Marketing Company's Bakersfield Refinery is matching the knowledge and skills of professionals with the space age technology of today's refining.

Facilities at the 113-acre site reflect the colorful history of refining dating back to the 1930s. Over those decades production steadily increased so that by 1979 the refinery was processing about 23,000 barrels of crude oil per day.

In 1975 plans began for the construction of a new refinery. Completed in 1979 at a cost of more than $70 million, the Bakersfield Refinery is an excellent example of state-of-the-art electronic instrumentation and environmental monitoring systems.

The current rated crude oil capacity for the refinery is approximately 63,000 barrels per day.

Refinery products include leaded regular, unleaded regular and unleaded premium grades of gasoline, diesel fuels for the transportation industry and a full range of fuel oils for industrial facilities.

The Bakersfield Refinery is expected to continue utilization of heavier crude oils forecasted to be available in Kern County, California. Special consideration will be given to Getty's proprietary raw materials position in the state.

Refining for the Future

Crude oil is a complex mixture of hydrocarbon compounds containing petroleum fractions such as low octane gasoline (naphtha), diesel and burner fuel. Crude oil also may contain a wide and varied range of heavy oils including asphalt. Whether "heavy" or "light", the crude oil must be distilled (fractionated) to separate it into various components for additional refinery processing.

The basic units of crude oil are molecules made up of carbon atoms linked with hydrogen atoms. Refining separates crude oil molecules into various hydrocarbon groups whose atoms are rearranged or juggled to form new pairings or compounds.

Some refining processes can be compared to a sophisticated pressure cooker in which the various hydrocarbon groups are "cooked" in large furnaces by steam or heat, sometimes in the presence of a catalyst, to achieve the necessary molecular changes.

Processes, which yield a variety of petroleum products, take place in a complex maze of tanks, pipes and vessels at Getty Refining and Marketing Company's Bakersfield Refinery.

Crude Unit
page 4

Vacuum Distillation
page 5

Major Facilities at the Refinery

Storage/Blending Facilities
page 10

Light End Fractionation
page 6

Gas Oil Desulfurizer
page 7

Catalytic HDS/Reforming
page 8

Sulfur Recovery Units
page 9

Waste Water Processes
page 11

Environmental Monitoring
page 12

Laboratory Operation
page 14

Crude Unit

Distillation involves heating the hydrocarbon liquid in a furnace to its boiling point or above. The liquid then moves to a fractionation column for physical separation into various components.

Depending on the number and type of hydrocarbon components desired, products are drawn from various locations in the fractionation column, ranging from top to bottom.

The crude units operate slightly above atmospheric pressure, and are capable of charging about 63,000 barrels per day.

Vacuum Distillation

Bottom product from the atmospheric crude distillation column is the feedstock for the vacuum distillation facilities. Vacuum distillation processes about 16,000 barrels per day.

The best method to get good products from this bottom feed is to process it under reduced pressure within a vacuum tower. If the pressure is reduced, boiling takes place at a lower temperature. At lower temperatures, the lighter portion of the bottom feedstock can be distilled without cracking.

Light End Fractionation

The overhead product from atmospheric crude distillation contains a range of light hydrocarbons including gasoline. Within the light end fractionation columns, the overhead product from the crude column undergoes separation. This produces approximately 11,000 barrels per day of two gasoline component streams plus propane and butane.

One gasoline component is blended directly into finished gasoline. The other component is of a low octane and requires additional processing in the reformer for octane improvement.

Gas Oil Desulfurizer

One of nature's additives to hydrocarbons in crude oil is sulfur. Depending on the source of the crude, the sulfur content can range from a tenth-weight percent to amounts 30 times as great.

The gas oil desulfurization process removes about 90 percent of the sulfur from the gas oil feed. The unit can process about 15,000 barrels per day of certain gas oils distilled from the crude charged to the atmospheric crude and vacuum distillation units. The refinery then uses this product in combination with other available oils to produce a wide range of low-sulfur fuel oils.

Catalytic HDS/Reforming

To produce the high-octane gasolines required today, the refinery must increase the octane of the naphtha distilled directly from the crude and produced by other refinery processes. The catalytic reformer rearranges hydrocarbon molecular structures by passing naphtha over a platinum catalyst at high temperatures and pressures. Prior to reforming, the naphtha is fed to a hydrodesulfurization (HDS) pretreatment unit which removes sulfur, nitrogen and metals which can poison the reforming catalyst. The HDS unit uses a different catalyst and also operates at a high temperature and pressure.

The reforming process produces large quantities of hydrogen gases. To remove the sulfur from hydrocarbons, much of the hydrogen is consumed in the gas oil desulfurization and naphtha hydrodesulfurization processes.

The refinery charges up to 9,200 barrels per day of naphtha stocks to the catalytic reformers for production of high-octane gasolines.

Sulfur Recovery Units

The gas oil desulfurization process releases large amounts of hydrogen sulfide gas; naphtha desulfurization releases small amounts. This is removed from hydrocarbon gas mixtures and is converted into pure sulfur within a sulfur conversion plant.

A major system within the sulfur recovery facility is the ammonium thiosulfate (ATS) plant. The ATS plant removes unconverted sulfur compounds from the sulfur plant effluent gas before it is discharged into the atmosphere.

ATS operations produce a high ammonia content water-based fertilizer. Approximately 20 tons per day of liquid sulfur can be produced from the sulfur recovery unit. That product is then shipped to customers by rail or truck.

Storage/Blending Facilities

Refinery crude oil, intermediate stocks and saleable products are stored in 70 storage tanks having a filled capacity of approximately 47 million gallons. The refinery requires a large storage capacity for variations in crude supply, process unit operation and product demand.

Product blending facilities using large capacity pumps and proportioning devices blend various product components into various grades of gasoline and fuel oil. Such additives include gasoline dyes, octane improvers, inhibitors, stabilizers and fluid flow improvers.

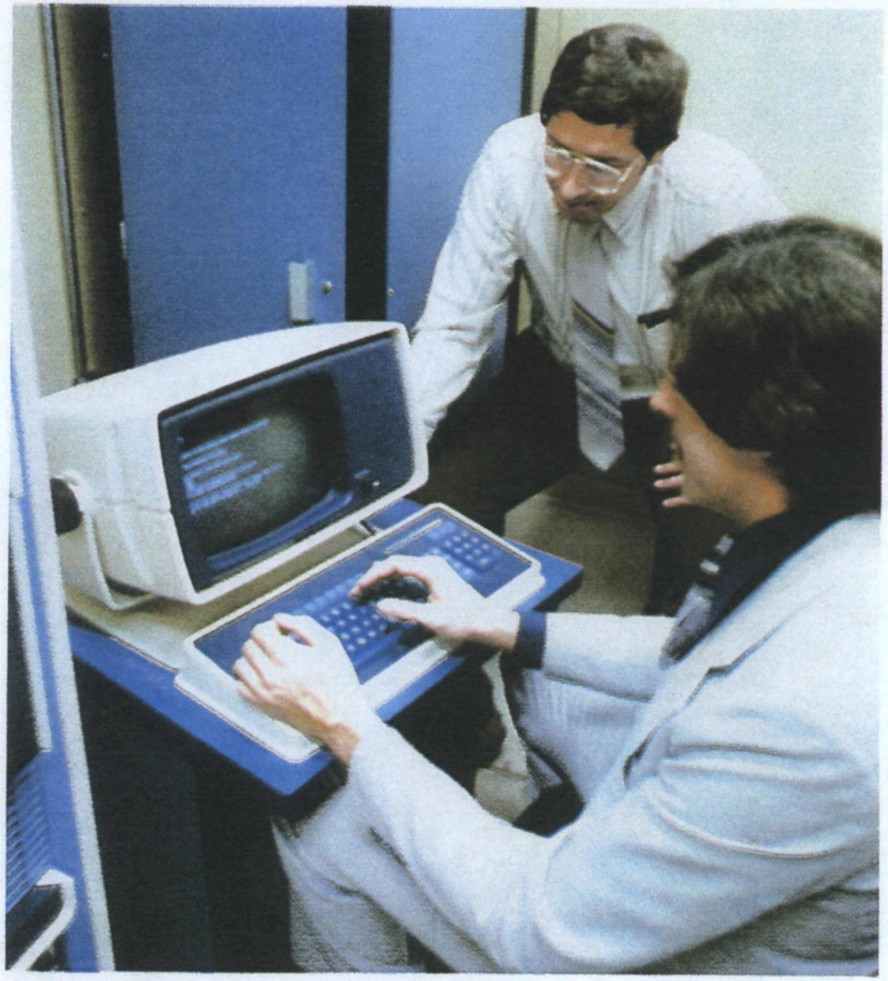
Waste Water Processes

The treatment of waste water is vital to refinery operations and to the environment. At the Bakersfield Refinery, approximately 250,000 gallons of waste water must be treated each day.

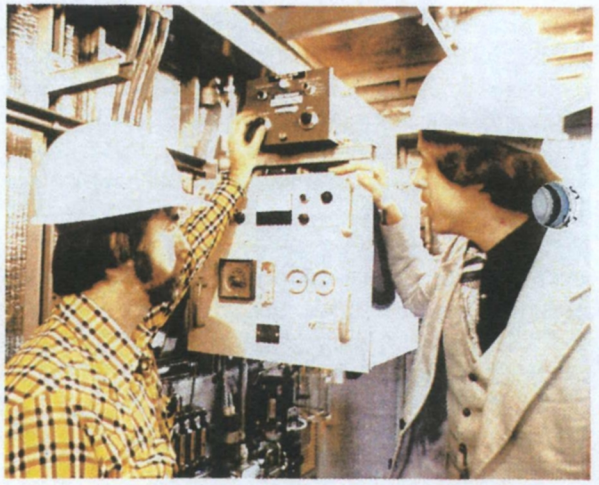
In the initial treatment, water moves through an oil water separator to remove floatable oil and suspended solids.

A second treatment sends the water through a froth-making device called an "air flotation unit" which accumulates small oil droplets and particulate matter in a layer of froth which is skimmed off.

The last treatment passes the water through a series of filters which removes the final traces of particulate matter. Pumps then inject the water 3,500 feet into converted and inactive oil wells.



Environmental Monitoring



The $750,000 Environmental Monitoring System (EMS) at the Bakersfield Refinery is representative of Getty Refining and Marketing's efforts toward emission control.

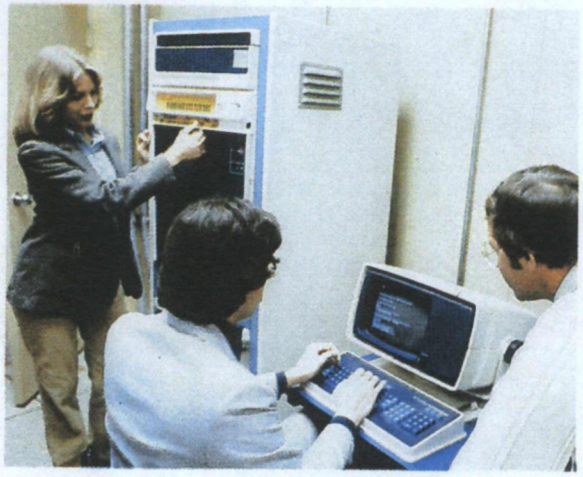
EMS is an environmental "intelligence" system built around the latest analysis technology, communications links and integrated computer systems.

Analyzer instrumentation accurately measures emission levels from various heaters, boilers, fuel gas supply sources and sulfur recovery facilities.

Communications linkages route emission data directly to control room operators for continuous monitoring.

Advanced data systems interrelate with the major refinery computer operations systems to provide vital information affecting emission levels.

Finally, the refinery's professional staff uses the data to insure compliance with company and governmental clean air requirements.



Laboratory Operation

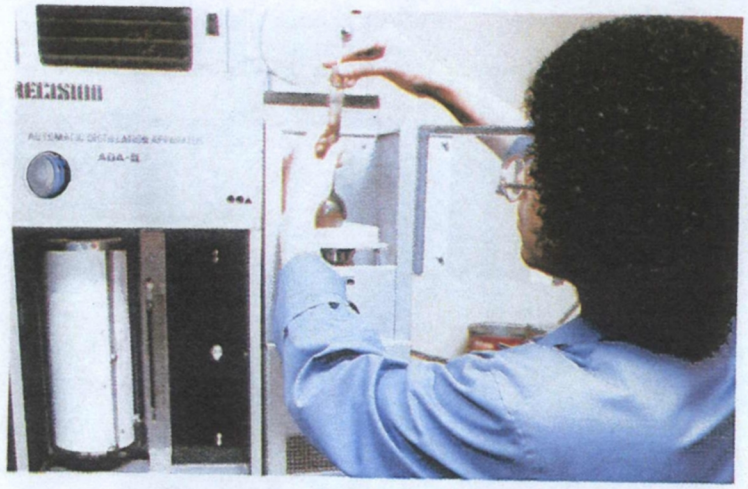
With the advanced tools of their trade, laboratory testers insure the quality and uniformity of company products.

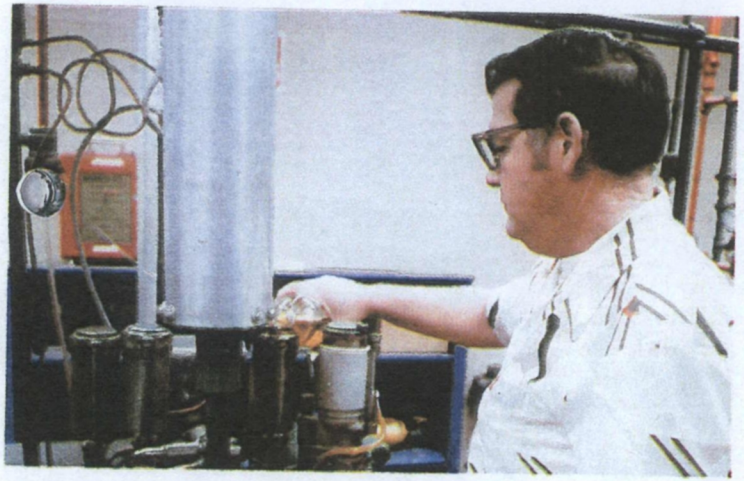
Control of the finished product begins with crude oil testing and continues through all phases of the refining process. It is complete with the testing of finished materials.

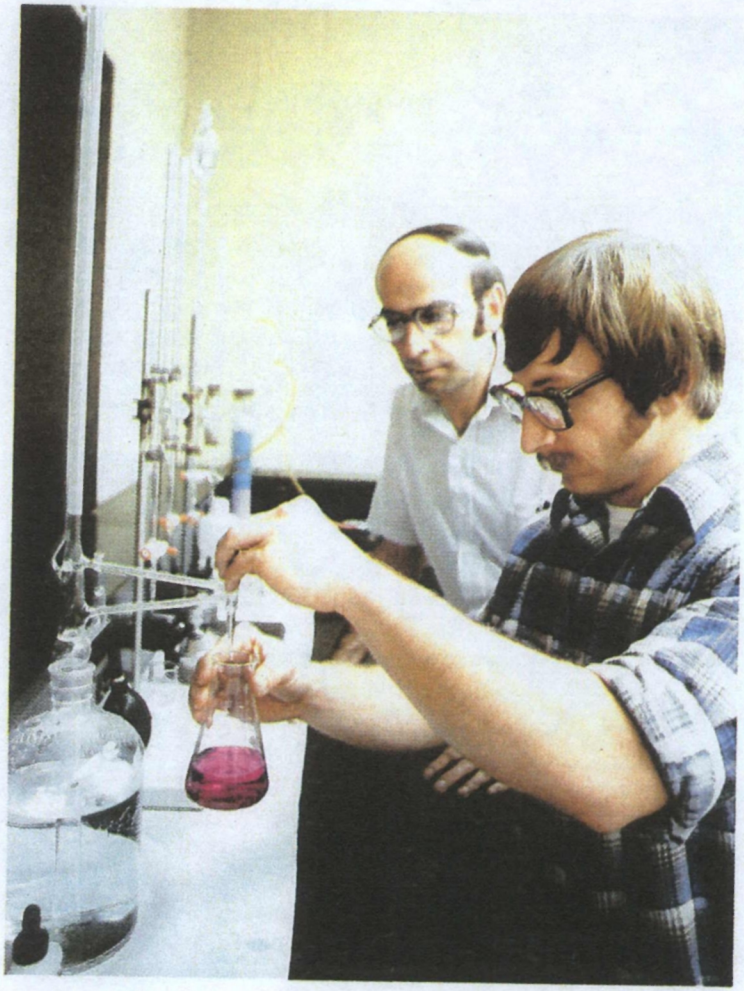
Testing is carried out in two laboratory sections:

Physical Testing: Testers determine physical data such as gravity, boiling range and viscosity of petroleum products. Waters from boilers, cooling towers and waste water facilities are analyzed for compliance with existing limits of control. Standard octane machines are used to determine the knock characteristics of gasoline blend stocks and finished gasolines. The results of laboratory testing are used by unit operators to adjust operating conditions and by oil movement personnel to release finished products for shipment.

Analytical Testing: This phase involves chemical analyses, the determination of metals by atomic absorption spectrometry, the testing of hydrocarbons by gas chromatography and pinpointing the presence of nitrogen, sulfur and chlorides by microcoulometry.


DECISION
AUTOMATIC DISTILLATION APPARATUS
ADA-2L





Meeting the Challenge

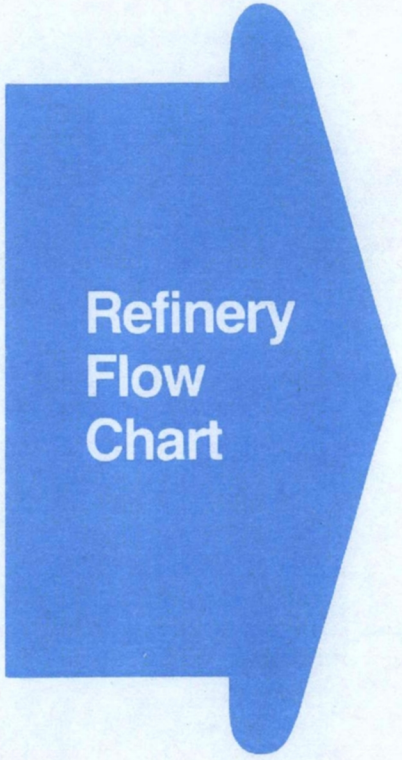
Getty Oil Company is an integrated petroleum company with more than 17,000 employees. Worldwide exploration and production operations help achieve the company's primary objective — the search for and development of crude oil and natural gas reserves. Complementing these activities, Getty conducts transportation, refining and marketing operations and is involved in the exploration for and production of minerals other than petroleum.

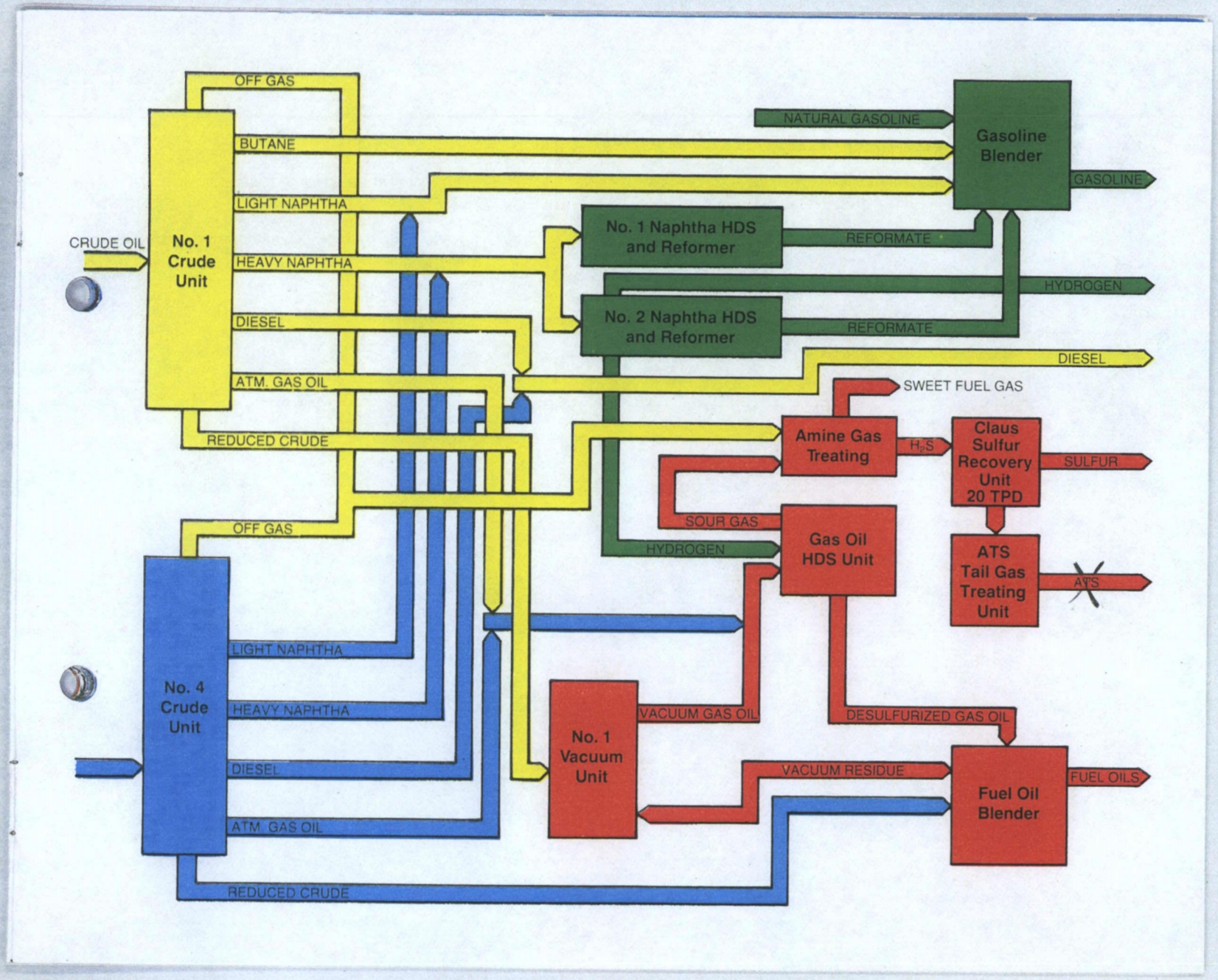
A smaller portion of Getty's business involves agriculture, real estate, wood products, chemicals, sports television programming via cable, and insurance. The company maintains its corporate headquarters in Los Angeles.

Getty Refining and Marketing Company, based in Tulsa, Oklahoma, operates the 140,000-barrel-per-day Delaware Refinery, the 80,600-barrel-per-day El Dorado Refinery in Kansas and the 63,000-barrel-per-day Bakersfield Refinery.

GRMC also markets petroleum products in the eastern United States under the Getty brand name, in the central states under the Skelly, Skelgas and Surfco brand names and in California under the Mohawk brand name.

The demand for energy will continue to grow. Getty is committed to doing its part to meet that challenge. It can do so by retaining a strong position in important earth resources, by balancing production with reliable transportation networks and by maintaining quality, service-oriented marketing outlets.




OFF GAS
BUTANE
LIGHT NAPHTHA
HEAVY NAPHTHA
DIESEL
ATM. GAS OIL
REDUCED CRUDE
CRUDE OIL
No. 1 Crude Unit
NATURAL GASOLINE
Gasoline Blender
GASOLINE
No. 1 Naphtha HDS and Reformer
REFORMATE
HYDROGEN
No. 2 Naphtha HDS and Reformer
REFORMATE
DIESEL
SWEET FUEL GAS
Amine Gas Treating
H_2S
Claus Sulfur Recovery Unit 20 TPD
SULFUR
SOUR GAS
HYDROGEN
Gas Oil HDS Unit
ATS Tail Gas Treating Unit
ATS
OFF GAS
LIGHT NAPHTHA
HEAVY NAPHTHA
DIESEL
ATM. GAS OIL
REDUCED CRUDE
No. 4 Crude Unit
No. 1 Vacuum Unit
VACUUM GAS OIL
DESULFURIZED GAS OIL
VACUUM RESIDUE
Fuel Oil Blender
FUEL OILS

Getty

Bakersfield Refinery • Box 1476 • Bakersfield, CA 93302